Eg. A 0.10 kg mass is dropped from a height of 0.70m. Determine:

a) Initial gravitational energy of the mass
b) The speed of the mass if it falls straight down
c) The speed of the mass if it falls through an arc of 1.2m of distance to the same bottom point.
d) If the speed at the bottom is only 2.0m/s, how much energy is lost? Where did it go?

P221-224 Q1-8

a) $E_g = mgh$

$= (0.101\text{kg})\left(9.80\frac{N}{1\text{kg}}\right)(0.70\text{m})$

$= \boxed{0.69\text{ J}}$

b) $E_g \rightarrow E_K$

$0.6866\text{ J} = \frac{1}{2}mv^2$

$0.686\,J = \frac{1}{2} m v^2$

$v = \sqrt{\frac{2(0.686\,J)}{(0.10\,kg)}}$

$\boxed{v = 3.7\,m/s}$

c) Same – Conservation of energy.

E_g is only dependent on height + mass.

d) $v = 2.0\,m/s$

Conserved

$E_{g\,initial} = E_{k\,f}$

Energy total initial = E total final

$E_{gi} = E_{Kf} + E_{lost}$

$0.686\,J = \frac{1}{2}(0.100\,kg)(2.0\,m/s)^2 + E_{lost}$

$0.686\,J = 0.20\,J + E_{lost}$

$E_{lost} = 0.49\,J$

Textbooks:

P226 CR 1.1-1.5 - 15minutes groups of 2 or 3 to come up and explain the question
P230 Q9-12

CR 1.1

a) [illegible]

a)  Grav. Energy increase
Work is being done
Chemical energy

b) Grav. → Kinetic

c) heat & sound

D) Gravity → kinetic

1.2 —

1.3 Work tu elastic to Ek

1.4 a) work → kinetic Energy

b) work → same
kinetic → same
speed → faster by $\frac{\sqrt{2}}{\sqrt{2}}$

√2

1. 5a) same momentum

b) speed → faster by double

c) 2 times the Ek

$\frac{1}{2}mv^2 \rightarrow \frac{1}{2}\left(\frac{1}{2}m\right)(2v)^2$

$\downarrow$

$\frac{1}{2}\frac{1}{2}m4v^2$

$2\left(\frac{1}{2}mv^2\right)$

$2E_{ki}$

Eg. A 0.10 kg mass is dropped from a height of

0.70m. Determine:

a) Initial gravitational energy of the mass
b) The speed of the mass if it falls straight down
c) The speed of the mass if it falls through an arc of 1.2m of distance to the same bottom point.
d) If the speed at the bottom is only 2.0m/s, how much energy is lost? Where did it go?

P221-224 Q1-8

a) $E_g = mgh$

$= (0.10\text{kg})\left(9.80\frac{N}{1\text{kg}}\right)(0.7\text{m})$

$= 0.686 = \boxed{0.69\text{J}}$

b) Kinematics

$a = 9.8\text{m/s}^2 \quad V_i = 0 \quad V_f = ?$

$d = 0.70\text{m}$

$V_f^2 = V_i^2 + 2ad$

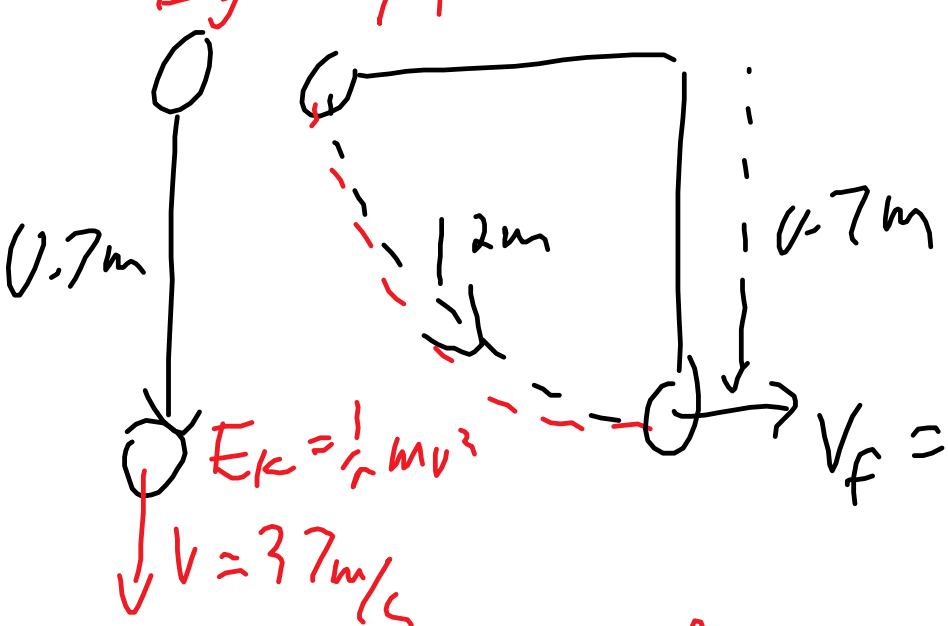
$V_f^2 = 0 + 2(9.8\,m/s^2)(0.7m)$

$V_f = \sqrt{13.}$

$V_f = 3.7\,m/s$

c)

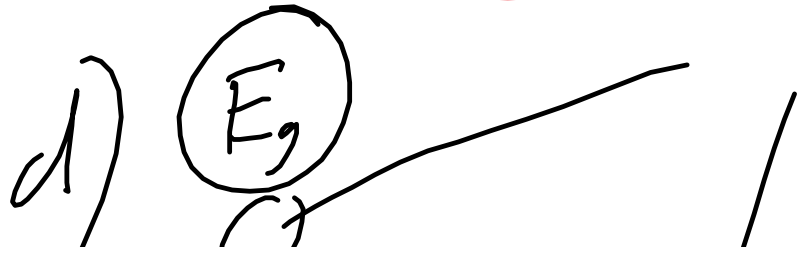
$E_g = mgh$

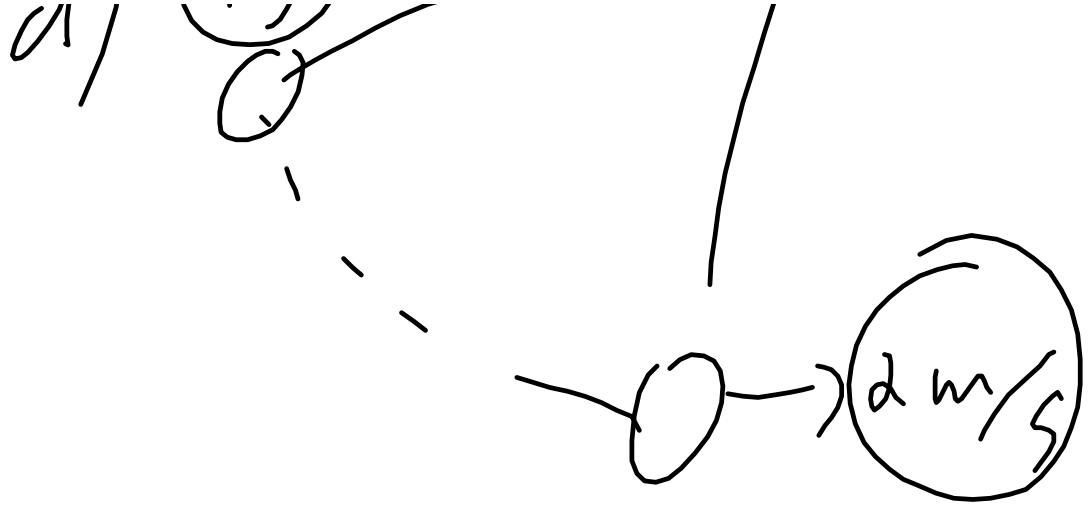


$0.686\,J = \frac{1}{2}(0.1\,kg)v^2$

$v = 3.7\,m/s$

d)





Total Energy initial = Total Energy f.

$E_g = E_K + E_{lost}$

$0.686J = \frac{1}{2}(0.1kg)(2m/s)^2 + E_{lost}$

$E_{lost} = 0.49J$

Textbooks:

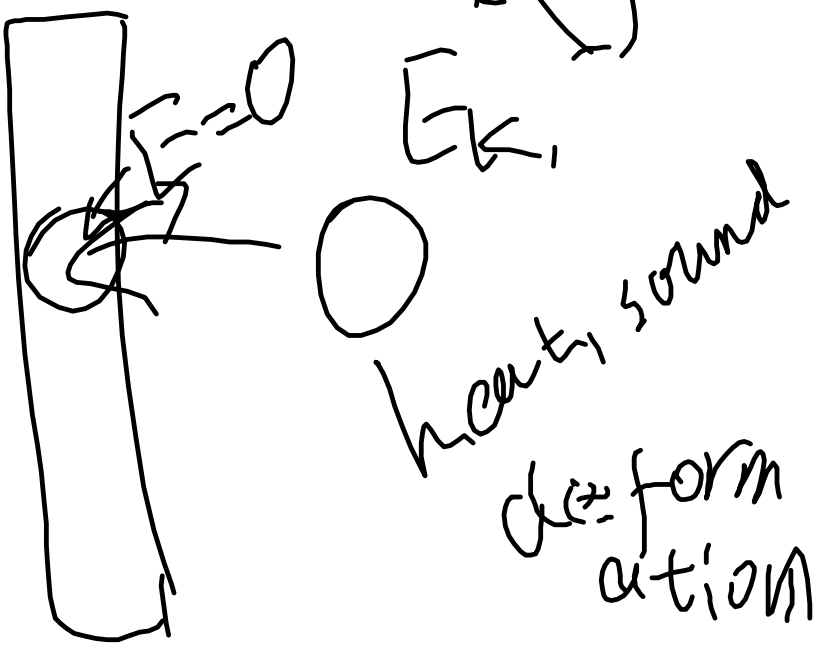
P226 CR 1.1-1.5 - 15minutes groups of 2 or 3 to come up and explain the question
P230 Q9-12

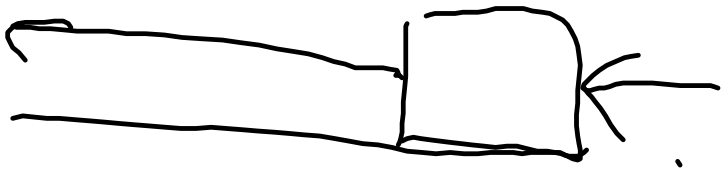
11 a) work every time you pull yourself up
increase in gravitational energy

b) hand does work by pushing the ball forward
Kinetic energy

c) Kinetic energy lost when it hits the glove
energy lost in heat, sound

d) gravitational energy changes to Kinetic as the ball starts to fall
a. hand work
save the energy from the





$\sqrt{2}$

$E=1/2mv^2$